257-011631-US(PAR)

Patent Application Papers Of:

Lawrence Janesky

For:

WALL AND SUB-FLOOR WATER DRAIN PANEL ASSEMBLY FOR BASEMENT WATER-CONTROL

WALL AND SUB-FLOOR WATER DRAIN PANEL ASSEMBLY FOR BASEMENT WATER-CONTROL

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates to improvements in wall and sub-floor water-control systems for receiving, channeling, collecting and expelling ground water from interior basement walls to beneath the floor of the basement and over the footing of basement rooms or other subterranean rooms having walls, wall-supporting footings and a floor. The problems caused by the invasion of ground water into basements and other structures are numerous. Generally such water seeps into basements from the walls and perimeter of the floor at the floor-wall and wall-footing joints, and/or through cracks, due to external hydrostatic pressures of water in the ground.

2. Brief Description of Related Developments

[0002] Wall and sub-floor water drain conduit systems are known in the patent literature but most such systems present problems with respect to strength, clog-resistance, drainage capacity in both lateral and longitudinal directions over the footing, and other disadvantages which have limited their use in commercial installations.

[0003] Reference is made to U.S. Patents 4,245,443; 4,745,716; 4,837,991; 4,869,032; 4,879,851, 5,051,044 and 5,771,643 as examples of proposed L-shaped wall/footing water drain panels which are installed in

position at the junction of the footing and the inside foundation wall prior to the pouring of the basement floor. Generally, these elongate panels are fabricated of relatively thin plastic which, depending upon design, can become crushed or distorted to some extent under the weight and pressure of the wet concrete composition poured thereagainst when the basement floor is poured over uneven horizontal footing surfaces or over such horizontal surfaces having dried concrete deposits thereon, thereby narrowing or closing the water-escape channels between the panels and the wall and/or the surface of the footing.

[0004] With L-shaped panels having an integral vertical wall-drain panel section and a horizontal footing-drain panel section, unless the panel sections extend at a right angle relative to each other and the wall and footing surfaces extend at the same angle relative to each other, and unless the footing surface is smooth and free of debris and dried concrete deposits, the weight of a concrete basement floor poured over the horizontal footing-drain panel section will distort the shape or flatness of the footing-drain panel section, and the distortion will be imparted to the vertical wall-drain panel section causing it to warp away from the wall and present a poor appearance around the interior periphery of the wall of the room. The vertical wall-drain panel is intended to be uniformly-spaced from the wall surface by a small distance, such as about 0.4 inch, but panel distortion can result in an uneven spacing, between no space and a spacing or one or more inches. Also, in most such panels, such as in Patent 4,745,716, water is channeled in only one

direction, down the wall and outwardly over the footing to the drain, while blocking the flow of water longitudinally along the horizontal surface of the footing. This presents problems when water escape is blocked or minimized in the lateral direction for any reason.

[0005] U.S. Patents 4,245,433, 4,745,716 disclose nestable L-shaped wall/footing water drain panel embodiments which are embossed to provide substantial structural contact between the poured basement floor and the surfaces of both the foundation and the footing, and which permit restricted water escape in both the lateral and longitudinal directions through narrow conduits. The barrier panels of these patents are either cut or bent to form an upper wall diverter panel section and a lower footing diverter panel section in which the narrow water-escape conduits must be aligned and non-crimped. In Patent 4,245,443 there is no planar or flat longitudinal upper conduit-free area to permit the concrete floor to be poured smoothly thereagainst, nor is there any planar or linear longitudinal conduit-free area at the discharge edge of the horizontal panel section to prevent or block entry of the wet concrete floor composition into the narrow water-escape conduits during pouring, causing blockage.

[0006] The system of U.S. Patent 4,869,032 requires weep holes drilled through the basement wall to admit water behind an embossed vertical panel and requires that the top margin of the vertical panel be cut off to provide access to a gap behind the vertical panel for water seeping through and down the basement wall. More

importantly, the system does not allow the flow and escape of water longitudinally along the upper surface of the horizontal footing.

SUMMARY OF THE INVENTION

[0007] The present invention provides a novel panel strip drainage system to be installed at the wall footing interface around the periphery of a basement room prior to the pouring of a concrete floor thereagainst. The present drainage strip is designed to permit the drainage of water vertically from basement wall cracks and horizontally from wall/footing interfaces into the drain tile system or drain conduit system adjacent the wall footing, to prevent the water from entering the basement room.

[0008] The present drainage strip comprises a vertical strip, such as one molded or extruded from a durable water-resistant plastic molding composition, having a smooth planar interior surface and having an opposed surface provided with stand-offs or spacers forming a water-drainage gap between the opposed surface of the drainage strip and a basement wall. The drainage strip also comprises a lower horizontal drainage section comprising a portion of said vertical strip which is contoured to extend away from the wall/footing interface and to contact the surface of the footing to form a horizontal water drainage conduit section forming a passage open to the wall/footing interface, and which extends longitudinally along the horizontal footing, which is enclosed except at spaced portions thereof which are provided with openings which permit the escape of water from the horizontal passage, out over the

surface of the footing and vertically down into the drainage tile or drain conduit or sub-slab aggregate. The spaced portions of the horizontal water drainage conduit section which have drain openings are associated with footing/floor spacer members which communicate with the spaced openings in the horizontal water-drainage conduit section and with the outer edge of the footing to permit the escape of water from the horizontal conduit section outwardly over the footing and into the drain tile or drain conduit. The footing/floor spacer members serve to prevent the wet concrete composition from contacting the surface of the footing in water-flow areas extending from the spaced openings in the horizontal water-drainage conduit and the opposed edges of the footing to prevent the sealing of the openings and the blocking of the water escape from the horizontal water drainage conduit into the drain tile when the basement floor is being poured.

[0009]

BRIEF DESCRIPTION OF THE DRAWINGS

[00010] The foregoing aspects and other features of the present invention are explained in the following description, taken in connection with the accompanying drawings, wherein:

Fig. 1 is a perspective view of a basement wall and footing having mounted at the interface thereof a water drainage panel section assembly according to the present invention;

Fig. 2 is a perspective rear view of a water drainage panel section according to the present invention;

Fig. 3 is a side edge view of a cross-section of a water drainage panel section assembly as in Fig. 1, in position adjacent the wall footing interface of the basement room, illustrating the concrete basement floor poured thereover;

Fig. 4 is a side edge view of a cross-section of a water drainage panel section assembly as in Fig. 1 but illustrating the use of a shield strip which is a length cut from the vertical drain strip, and

Fig. 5 is a perspective view of a drainage panel section assembly as in Fig. 4 also illustrating the use of a shield strip which is a length cut from the vertical drain strip.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT(s)

[00011] Referring to Figs. 1 and 2 of the drawings, the present wall and sub-floor water drain panel 10 is a strong, flexible, semi-rigid panel molded from a suitable plastic composition, such as a polystyrene, polyethylene, polyvinyl chloride, nylon or acrylonitrile-butadiene-styrene polymer (ABS) in a flat shape so as to lay flat against a basement wall 11 and stand on the supporting concrete footing 12 at the wall/footing interface as illustrated by figs. 1 and 3,. The panel 10 has an upper, vertical wall-engaging section 13 and a lower skirt section 14 which curves or projects outwardly from vertical to form a horizontal water drainage conduit portion 15 adjacent the wall footing interface, which enables water which enters from the interface to be confined and to flow along the

length of the footing 12. The drain panel 10 is also provided with or molded with spaced stand-off ribs 16 or spacer ribs which support the panel in spaced position against the surface of the basement wall, leaving a vertical drain space 17 therebetween to allow any water seepage to flow down the wall behind the panel 10. The spacer ribs 16 are provided with holes or cut-outs 18 to enable the vertical water seepage down into the horizontal water drainage conduit portion 15, and the lower footing engaging skirt section 14 of the panel 10 is provided with spaced holes or cut-outs 19 which enable the water to escape from the horizontal water-drainage conduit portion 15 of the panel section 14 and flow outwardly over the footing 12 and down into a drainage tile or gravel bed 20.

[00012] The number of holes or cut-outs 19 in the wall of the footing-engaging skirt section 14 of the present water drain panel 10 generally is small, for example one for each 8 to 12 feet of wall length. The holes or cut-outs 19 must be shielded against being sealed or blocked with wet concrete when the concrete floor 21 is poured over the footing 12 and against the base of the wall 11 and is hardened. This is accomplished by applying a narrow shield strip 22 over each area of the footing-engaging section 14 of the panel 10 having a hole or cut out 19, before the basement floor is poured. The narrow shield 22 must be one which is resistant to being crushed under the weight of the concrete, so as to provide an open water drainage path or conduit beneath the floor 21 and over the footing 12, communicating between each hole 19 and the opposed edge of the footing 12.

[00013] A preferred narrow shield strip 22 is illustrated in Figs. 1 and 3 of the drawings.

[00014] The horizontal narrow shield strip 22 is a strong rigid plastic which carries a plurality of uniformly-spaced, linearly-arranged wells 23 having walls which taper downwardly and inwardly to a seat or frustrum 24. The wells 23 have wide inlet ends to permit the wet concrete composition of the poured basement floor 21 to enter and fill the wells 23 down to their floor or frustrum 24 to support the shield strip 22 against the footing 12 and prevent collapse or narrowing of the water-flow space 25 between the shield strip 22 and the upper surface of the footing 12. The marginal border at the top of the vertical panel section 13 provides a barrier which prevents the wet concrete floor composition from flowing against the surface of the wall 11 and behind the panel section 13, and provide a uniformly-spaced continuous inlet 17 to permit water to flow down the surface of the wall 11, such as from cracks, down into the horizontal water drain conduit portion 15 and out through water escape holes 19 into water flow spaces 25 between the wells 23 under the shield strip 22. The water-flow space 25 beneath the shield strips 22 over the footing communicates with the horizontal drainage conduit section 15 to drain the volume of incoming flood water which generally enters between the base of the wall 11 and the supporting surface of the footing 12 or by gravity flow through hollow cement blocks, in the case of cement block walls. The water flows down horizontally through the conduit section 15, out through escape holes 19 and water flow spaces 25 and eventually flows over the edge of the

footing 12 down into an aggregate drain tile 20 such as a porous drain pipe embedded in a gravel field. Also, the water drain conduit portion 15 is required to drain water which accumulates along the surface of he footing, from the wall/footing interface, and flows longitudinally along the length of the footing 12, as well as water which flows down the wall through water flow space 17.

[00015] The narrow shield strips, one for each opening 19 in the lower skirt section 14 of the panel 10, preferably have a marginal border 26, which extends beyond the edges of the shield strip 22 at each side and at the end thereof, so as to extend beyond the edge of the footing 12, and preferably is tapered downwardly, as illustrated, to prevent the flow of the wet concrete floor composition under the shield strip 22 and into the water-flow passages 25.

As can be seen from the present drawings, the under surfaces of the wells 23 provide a plurality of evenly-spaced small round contact areas with the footing 12, thereby minimizing any reduction in the area of the water-flow spaces 25 and permitting free water flow, transversely under the shield strip 22.

Most preferably the present semi-rigid water drain shield strips 22 are molded of super high impact styrene polymer in a thickness of about 0,.04" and then formed into the desired configuration and cut into the desired widths. The spaced wells 23 molded down into the surface of the shield strips 22 have an entry diameter of about 1.25 inch, a depth to floor or seat 18 of about 0.25 inch, and wall contact area 18a diameter of about

0.40 inch, providing a water flow passage 25 about 0.38 inch wide between the shield strip 22 and the surface of footing 12 . Panel section 13 has a height of about 4.25 inches above the surface of the footing 12, and the panel 10 preferably is formed in lengths of about six, ten and twelve feet.

The preferred transition area is a curved lower skirt section 14, as illustrated in Fig. 2, since it imparts maximum rigidity to the panel 10 and it also encloses and maximizes the horizontal water-flow space 15 adjacent the interface of the wall 11 and the footing 12.

The shield strips 22 have a width of about 5 inches so that the tapered outer marginal area 26 extends about an inch beyond the outer edge of the strip sides and end to prevent the wet concrete composition from any back flow under the shield strips 22 which would block the water flow from space 25 into the drain tile conduit 20.

The design of the present drain panels 10 enables the wet, concrete floor composition to flow down into the wide entrance areas of the tapered wells 23 to fill them and form uniformly spaced cured concrete posts or stand-offs which provide uniform structural strength between the basement floor 21 and the horizontal footing 12. More importantly, the plurality of uniformly spaced, small diameter contact posts or stand-offs minimize the overall areas of the drain panel 10 which contacts the footing 12 to less than 20%, preferably less than 10%, and maximize the areas of the wall and footing which is free of contact and is open to the free flow of water in spaces 25. For example, the spaced contact areas of the

preferred barrier panel illustrated in the drawings cover only about 8% of the total surface of the footing 12 beneath the panel sections 13 and 14 to provide a maximized water flow area 25 of about 92%. The tapered shape of the wells 16 and 17 facilitates flow of the wet concrete composition to fill the wells and also minimizes the space within the water flow areas 25 which is displaced by the wells 23, to maximize the capacity of the water flow from the water flow conduit area 15.

Preferably, the present wells 23 are linearly arranged to enable the shield strips 22 to be nested and stacked to minimize packaging and storage space.

While the narrow shield strips 22 illustrated in Figs. 1 and 3 of the drawings represent a preferred embodiment of the present invention, it should be understood that a variety of other drain conduits can also be used to communicate with the horizontal drain space 15 formed by or enclosed by the lower curved skirt 14 of the panel 10 at the wall/footing interface, through openings or cut-outs 19. For example lengths of metal pipe or PVC conduit can be inserted into round openings 19 formed in skirt 14 to extend out over the edge of the footing 12. Alternatively, as illustrated by Figs. 4 and 5 a length of the present drain panel 10 can be laid on its back, supported on its stand-off ribs 16 against the footing 12 extending perpendicular to the wall 11 over the edge of the footing 12 and communicating through an opening 19 in the panel skirt 14 to provide a water escape path between the ribs 16 after the floor 21 is poured. The embodiments of Figs. 4 and 5 are advantageous because the shield strips 22 are cut from the same plastic strip

as used for the vertical drain panel 10. In the embodiments of Figs. 4 and 5 a suitable length of the drain panel 10, such as an 8" to 12" length is cut and laid horizontally, supported on its spaced stand-off ribs 16 against the upper surface of the footing 12 to provide shield strips 22. In Fig. 4 the cut shield strip 22 is merely turned over or inverted so that its curved skirt 14 is placed over the curved skirt 14 of the vertical drain panel 10 so that a drain hole 19 in the drain panel 10 opens beneath the shield strip 22. The stand off ribs 16 extend parallel to the surface of the wall 11 and to the drainage conduit portion 15 but they permit the escape of water therefrom, through the drain hole 19 and through the holes or spaces 18 in the stand-off ribs 16, across the horizontal surface of the footing 12 and into the drain tile 20.

In the embodiment of Fig. 5, the cut length of drain panel 10 used as shield strip 22 is further cut to remove the curved skirt section 14 shown by broken lines in Fig. 5, and is inverted and turned or rotated 90° so that it is supported on its ribs 16 on the surface of the footing and has a side edge thereof in contact with an area of the curved skirt 14 including a drain opening 19. The supporting ribs 16 of the shield strip 22 are spaced from each other to provide a water drain path from the drainage conduit portion 15 of the vertical drain panel 10, through an opening 19, under the shield strip 22 and between the ribs 16 over the edge of the footing 12 and into the drain tile 20. A variety of other drainage means, able to support the weight of the concrete floor apron, will be apparent to those skilled in the art in the light of the present disclosure.

[00016] It should be understood that the foregoing description is only illustrative of the invention. Various alternatives and modifications can be devised by those skilled in the art without departing from the invention. Accordingly, the present invention is intended to embrace all such alternatives, modifications and variances which fall within the scope of the appended claims.

CLAIMS